

Notes on the behaviour and ecology of Sharpe's Longclaw *Macronyx sharpei*, a threatened Kenyan grassland endemic

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Sharpe's Longclaw *Macronyx sharpei*, a Kenyan endemic and restricted-range bird species, is confined to the Kenyan Mountains Endemic Bird Area (EBA) in the country's central highlands (Zimmerman *et al.* 1996, Stattersfield *et al.* 1998). It is known from grassland on the plateaux to either side of the central Rift Valley, and parts of Mt Elgon, Mt Kenya and the Aberdares (Britton 1980, Lewis & Pomeroy 1989, Zimmerman *et al.* 1996). Collar *et al.* (1994) listed Sharpe's Longclaw as near-threatened, but its status has been revised to globally Vulnerable in the light of recent information on its status (BirdLife International 2000).

During studies undertaken in 1995 and 1996, we documented grassland habitat selection (Muchai *et al.* in press) and response to grassland fragmentation (Lens *et al.* 2000), as well as community attitudes towards Sharpe's Longclaw conservation (Muchai *et al.* in review). However, basic behavioural information on this species, necessary for successful conservation (see examples in Caughley & Gunn 1996, Clemmons & Buchholz 1997) is still very patchy. Some anecdotal observations are summarised in Keith *et al.* (1992). This paper describes our observations on the species' behaviour, in particular breeding, roosting, foraging, territoriality and social organisation, adding to or confirming what is already on record.

Study area and methods

From April 1995 to March 1996 we observed and counted Sharpe's Longclaws in forty 4-ha grassland plots on a 60-km transect within the Kinangop Plateau (Nyandarua district, central Kenya: 0°32'–46' S; 36°29'–38' E). This is a stretch of montane grassland at 2400–3000 m altitude located between the Aberdare mountains (the easternmost scarp of the Gregory Rift Valley) and the rift floor. Additional details are given in Lens *et al.* (2000) and Bennun & Njoroge (1999). Between November 1995 and May 1996, detailed behavioural data were collected in a 3-km² study site near the village of Heni (South Kinangop; 0°46'70" S; 36°33'10" E).

The in-depth behavioural and ecological study at Heni involved regular longclaw censuses (using a 50-m rope held between two observers and dragged over the grass) and mapping in six plots (18–27 ha) each divided

into six sub-plots (4–5 ha) (additional details are given in Muchai *et al.*, in press). Other bird species in the grasslands were also recorded. Detailed behavioural observations were also regularly made at randomly selected sites representing the three main grassland types (short grass without tussocks, short grass with tussocks and long grass: Lens *et al.* 2000). Behaviour was recorded by individual scan-sampling (Altman 1974). Using a funnel cage system we trapped two individuals, which were colour-banded and wing-tagged. These individuals provided additional information on territorial behaviour and patterns of mobility.

Results and discussion

Population composition

At the Heni study site, a total of 123 Sharpe's Longclaws were observed in 41 territories. These included 105 adults, 11 immatures, 5 juveniles and 2 nestlings. One adult and one fully-grown bird were caught and wing-tagged. They weighed 39.0 g and 39.4 g respectively; other biometrics were within the ranges given by Keith *et al.* (1992).

Escape tactics

Sharpe's Longclaw was usually found on the ground. At the approach of an observer, the birds generally walked or ran quickly away, trying to hide in the grass or behind a tussock. In open areas they might crouch close to the ground. When approached closely, the birds flew with reluctance. As tussock vegetation presumably is essential for hiding, its removal might have considerable conservation implications (see Lens *et al.* 2000).

Flight and display

Several types of flight were observed:

- 1 The male's display flight is well described by Keith *et al.* (1992). Individual birds differed in the duration of aerial display, but these flights lasted at most 10 minutes and ended with a sharp drop straight down to the ground. Display flight was observed throughout the study period. Although quantitative data are lacking, display was infrequent during the non-breeding period, when males might display once or twice a day, compared to the breeding season, when males displayed approximately once an hour.
- 2 When flushed, individuals generally flew low and straight for a short distance, usually less than 50 m, descending in a shallow, gradual, fluttering glide (1,264 observations). Such flights were usually accompanied by a contact call (see below). Less frequently, individuals rose almost vertically upwards for about 20 m, without singing, then dropped rapidly down to the ground a short distance away (76 observations).

- 3 The birds made low, straight flights when moving between foraging patches.
- 4 Two to three birds followed each other in a chasing style in quick, swift and manoeuvring low flights and then quickly alighted. This kind of flight behaviour was mainly observed during early sunny mornings (98 observations). Similar short, rapidly fluttering flights by breeding pairs are described by Keith *et al.* (1992).

Voice and song

The birds made a variety of calls:

- 1 The contact call was a soft thin *tsip-tsip-tsip* note repeated during low, straight flights.
- 2 The flight display song was heard frequently during the breeding season, but also at other times. It consisted of a series of variably-pitched notes, *yo-yo-yo-yo twi tue*.
- 3 Territorial males sang from a perch on a fence, post or grass tussock with a thin repeated *cheeu* or *tue-tu-tui-wee*.
- 4 A *tswip* call (like a modified, partial contact call), possibly an alarm call.
- 5 A mobbing call, *chruuuu*.

The juvenile begging call was a loud *tschhh*, *tschhh* typical of passerine nestlings.

Breeding habits

Between 22 April and 3 May 1996 we found one empty nest, one nest with two eggs (another nest with two eggs was found 27 June 1995) and one nest with two nestlings (observed until they fledged on 3 May 1996). Individuals in eight other territories were observed carrying food during the same period, which, as expected, was immediately after the peak rainy season (cf. Keith *et al.* 1992). Although we looked for nests when birds were flushed just under the rope or when flushed birds showed behaviour suggestive of nesting, we did not specifically search for nests during other periods of the year.

All the nests were hidden at the base of bending grass tussocks. The cup-shaped nests were 6 cm in diameter, 9 cm deep, and made of fine grass. The eggs were pale greenish-cream with some dark-brown speckling.

Nestlings (around six days old when found) were observed for nine days until fledging. The nestlings were fed on insects, mainly beetles and grasshoppers. When first located, the nestlings' reddish-pink bodies were covered by long blackish-grey down. The legs were reddish yellow and relatively long-clawed. The gape was bright yellow and the inside of the mouth pale red. At fledging, the young birds appeared as described by Keith *et al.* (1992).

At least two adults were seen bringing in food and attending the nestlings. Undisturbed birds carrying food would land some 20 m away from the nest, then cautiously walk towards it. In three other territories, attempts to locate the nest by following adults carrying food failed, due to alarm calls given by 'watchers' among the group. The birds carrying food responded by walking back, and sometimes eating the food item. As described by Keith *et al.* (1992), birds flushed from the nest flew heavily for a short distance and then ran as if injured, 'freezing' for some seconds before flying again.

Sharpe's Longclaws were often found in groups of more than two birds. Very little is known about the species' social structure and breeding biology. However, a number of studies, notably that of Komdeur (1992, 1994) on Seychelles Warblers *Acrocephalus sechellensis*, have shown that habitat quality may determine the extent of co-operative breeding behaviour in a population. In this study, group sizes of Sharpe's Longclaw ranged from 2–7, with the larger groups in higher-quality areas. It is possible that Kinangop Plateau habitats are already saturated, reducing the chances of young birds acquiring good territories and breeding. Our data are consistent with potential breeders in the scarce, high-quality habitats choosing to remain in their natal territories. While co-operative breeding has not been conclusively demonstrated in this species, it is suggestive that supernumerary 'watcher' birds gave alarm calls when we attempted to follow adults that were carrying food to the nest. More research is needed to establish the birds' social system, as this too may have implications for their conservation (cf. Njoroge & Bennun 2000).

Roosting

Sharpe's Longclaw roosted solitarily on the ground. The roosting site for the night was either a hollow scooped out by the bird at the base of a tussock or a hollow within a tussock. No particular site appeared to be used regularly.

Preening

Sharpe's Longclaw usually preened while on the ground (289 observations made). Preening was observed at any time whenever a bird rested, or while it basked during early sunny mornings or after rain.

Feeding

A total of 20,960 pecks were recorded during 90 hours of observation. The birds foraged by walking through the grass and searching for prey, sometimes running after particular items. Prey items were mainly obtained from the surface of short grasses (98% of the pecks), but occasionally from grass tussocks or particular herbaceous plants, mainly *Conyza* spp. Aerial feeding on flying insects was observed three times. Prey items included beetles, grasshoppers, bugs, ants, butterflies and spiders. Although the birds were often observed from just 5–10 m distance, other prey items could not

be identified. Large prey items like grasshoppers were hit against the ground in an effort to break them. The longclaws' preferred foraging locations included areas of short grass with tussocks, or open patches among tall grass. Heavily-grazed grasslands, and non-grassland areas (shambas, woodlots, bare ground and weedy areas) were consistently avoided during the study period. Birds usually flew to a new site after about an hour or so of foraging in one area.

Sharpe's Longclaw was a solitary feeder and rarely foraged close to conspecifics or individuals of other species. However, it sometimes interacted with Grassland Pipit *Anthus cinnamomeus*, Yellow-throated Longclaw *Macronyx croceus*, and Fiscal Shrike *Lanius collaris*, and more rarely with Red-capped Lark *Calandrella cinerea*, Rufous-naped Lark *Mirafra africana*, Stonechat *Saxicola torquata* and Yellow Wagtail *Motacilla flava*. In all the interactions with Grassland Pipit ($n = 18$), Yellow-throated Longclaw ($n = 5$) and Fiscal Shrike ($n = 8$), Sharpe's Longclaw was subordinate. On two occasions, Black-winged Plovers *Vanellus melanopterus* were observed showing aggressive behaviour towards Sharpe's Longclaws. The few interspecific interactions suggest that these grassland species may have different microhabitat and foraging site preferences.

Territorial behaviour

Only males appeared to defend territories actively. Territorial defence included display flights and songs, calls made while perching on posts or tall tussocks near the boundary of the territory, and actual physical contact and chasing of intruders (95 observations). In a territorial group with five members, two of which were males (one wing-tagged), only one of the males demonstrated territorial behaviour.

Sharpe's Longclaw occupied different sections within the territories on a rotation basis, remaining in a section for about a week and then shifting to another. Except on very cold mornings, birds left the roost site at dawn and started foraging immediately.

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References

- Altman, J. 1974. Observational study of behaviour: sampling methods. *Behaviour* 49: 227-264.
- Bennun, L. & Njoroge, P. 1999. *Important bird areas in Kenya*. Nairobi: EANHS.

- BirdLife International 2000. *Threatened birds of the world*. Barcelona and Cambridge, UK: Lynx Edicions and BirdLife International.
- Britton, P.L. 1980. *Birds of East Africa: their habitat, status and distribution*. Nairobi: EANH.S.
- Caughley, G. & Gunn, A. 1996. *Conservation biology in theory and practice*. Oxford: Blackwell Science.
- Clemmons, J.R. & Buchholz, R. 1997. *Behavioural approaches to conservation in the wild*. Cambridge, UK: Cambridge University Press.
- Collar, N.J., Crosby, M.J. & Stattersfield, A.J. 1994. *Birds to Watch 2: The world list of threatened species*. Cambridge: Birdlife International.
- Keith, G.S., Urban, E.K. & Fry, C.H. 1992. *The birds of Africa*. Vol. 4. London: Academic Press.
- Komdeur, J. 1992. Importance of habitat saturation and territory for evolution of cooperative breeding in the Seychelles Warbler. *Nature*, London 358: 493–495.
- Komdeur, J. 1994. Conserving the Seychelles Warbler *Acrocephalus sechellensis* by translocation from Cousin Island to the islands of Aride and Cousine. *Biological Conservation* 67: 143–152.
- Lens, L., Muchai, M., Bennun, L. & Duchateau, L. 2000. How grassland fragmentation and change in land-use affect Sharpe's Longclaw, *Macronyx sharpei*, a Kenya highland endemic. *Ostrich* 71: 300–303.
- Lewis, A. & Pomeroy, D.E. 1989. *A bird atlas of Kenya*. Balkema Publishers, Rotterdam.
- Muchai, M., Lens, L. & Bennun, L. (in press). Habitat selection by Sharpe's Longclaw, *Macronyx sharpei*, a threatened Kenyan grassland endemic. *Biological Conservation*.
- Muchai, M., Bennun, L.A., Lens, L., Rayment, M. & Pisano, G. (in review). Community attitudes, land-use, economics and the conservation of Sharpe's Longclaw *Macronyx sharpei*. *Bird Conservation International*.
- Njoroge, P. & Bennun, L. 2000. Status and conservation of Hinde's Babbler *Turdoides hindei*, a threatened species in an agricultural landscape. *Ostrich* 71: 69–72.
- Stattersfield, A.J., Crosby, M.J., Long, A.J. & Wege, D.C. 1998. *Endemic bird areas of the world: Priorities for conservation*. Birdlife Conservation Series No. 7. Cambridge: BirdLife International.
- Zimmerman, D. A., Turner, D. A. & Pearson, D. J. 1996. *Birds of Kenya and northern Tanzania*. Halfway House, South Africa: Russel Friedman Books.

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